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REMARKS

Disposition of Claims

Upon entry of the foregoing amendments, claims 1-22 will remain pending in the application and stand ready for further action on the merits. Claim 1 has been amended to clarify that the nozzle extends from the end wall portion of the elongated cartridge body. This amendment is fully supported by the specification, particularly at page 4 (paragraph 2) and the drawings. In addition, claim 11 has been amended to clarify that the inner cylindrical body wall of the elongated body has a chamber wall exit port rim. This amendment is also fully supported by the specification, particularly at page 3 (paragraph 2), page 5 (paragraph (3)), and the drawings. Claim 23 was canceled in a previous amendment.

Claim Rejections

The Office Action first rejects claim 11 under 35 U.S.C. § 112, second paragraph asserting that the term, "said inner chamber wall" (line 16) lacks antecedent basis. Claim 11 has been amended herein to clarify that the "inner chamber wall" (line 16) refers to the "cylindrical inner body wall of said elongated body" (line 4). In view of this amendment, it is believed that claim 11 meets all of the requirements under 35 U.S.C. § 112.

Next, the Office Action rejects claims 1-18 and 20-22 under 35 U.S.C. § 103(a) as being unpatentable over Evers et al., U.S. Patent 6,503,084 ("Evers") in view of Bender, U.S. Patent 5,707,234 ("Bender") and Schulman, U.S. Patent 5,460,523 ("Schulman"). It is respectfully submitted that the presently claimed invention, as recited in amended claims 1-18 and 20-22, is not prima facie obvious over the combination of Evers, Bender, and Schulman for the reasons discussed below.

Applicant agrees with the Examiner that Evers generally discloses a capsule-like cartridge having an elongated cylindrical wall. The cartridge is filled with high viscosity dental material. The cylindrical body has a hemispherical forward-facing end portion and an open

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rearward-facing end portion. A flange (5) extends outwardly about the open end portion, while a discharge nozzle (3) extends at an obtuse angle from the hemispherical front end wall. A needle cannula (4) is press-fitted into the nozzle. The dental material is forced through the discharge nozzle by a piston that slides along the inner walls of the cartridge chamber. But, as the Examiner recognizes, Evers fails to disclose some key elements recited in claims 1 and 11, particularly: a) an ejector-type holder for mounting the cartridge, and b) a hemispherical end wall portion having a thickness greater than the cylindrical body wall. Nevertheless, the Examiner asserts that both of these elements are known in the art, and it would have been obvious to modify the cartridge described in Evers so that it included these elements. The Examiner turns to the disclosures in Bender and Schulman to support this position. Applicant respectfully traverses this rejection.

Concerning the Bender patent, Applicant agrees with the Examiner that this reference discloses an ejector-type holder for supporting a cartridge or capsule (34) containing dental material. The gun-like applicator includes a plunger (18) for dispensing material through a discharge nipple (64) integrally molded to the capsule (34). The body portion of the capsule (34) is cylindrical and the closed end portion (62) is preferably hemispherical. A piston (66) having a complementary shape to the interior shape of the capsule (34) is provided for extruding the material. However, Applicant respectfully submits that a person of ordinary skill in the art would have no basis for combining the teachings in Evers and Bender. There must be some hint, suggestion, or motivation in the disclosures of Evers and Bender for combining these references. Evers provides no hint for seating the cartridge in an ejector-type holder as described in Bender. Looking at the disclosure in Evers, a person of ordinary skill in the art would have no reason to modify the cartridge structure so that it could be fitted in the ejector-type holder of Bender.

On the other hand, Schulman provides a cartridge that can be seated in a gun-like applicator for dispensing dental composite materials. Referring to FIG. 1 in Schulman, the cartridge has an elongated cylindrical hollow body (12) and a discharge nozzle (14). The body has an open end (16) and discharge end (18). The discharge end (18) is joined to the discharge nozzle (14) (col. 2, lines 27-33). The wall thickness of the discharge nozzle (14) tapers off in the direction of the discharge opening (36). The thickest portion of the discharge nozzle wall is

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adjacent to the end wall portion of the cylindrical body, and the thinnest portion is adjacent to the discharge opening (col. 3, lines 45-50).

However, even if the disclosures in Evers and Schulman were combined, it is respectfully submitted that the presently claimed invention would not be obvious to a person of ordinary skill in the art. As the examiner recognizes, the discharge nozzle (14) in Schulman is distinct from the cylindrical body (12). These two components are conjoined at an intersection.

The intersection of the discharge end (18) of the body (12), and the discharge nozzle (14) defines a planar end wall (32). The planar end wall intersects the body 12 at an angle relative to the longitudinal axis of the body 12. (Col. 2, lines 55-58).

As shown in FIG. 1 of Schulman, the wall thickness of the discharge nozzle (14) continuously tapers from its intersection with the cylindrical body (12) to the discharge opening (36). That is, the wall thickness of the discharge nozzle (14) is not uniform – it gradually decreases towards the discharge opening (36). But, the wall thickness of the cylindrical body (12) is uniform. There is no variation in thickness of the cylindrical wall in the cartridge – the wall thickness of the open end portion (16) is of the same thickness as the discharge end portion (18).

In sharp contrast to the uniform wall thickness of the cylindrical body in Schulman, the cartridge of the present invention includes an elongated body with substantially non-uniform wall thickness. Particularly, the elongated body includes an end wall portion (54) having a thickness substantially greater than the thickness of the body wall (48) as shown in FIGS. 3, 4, and 6. Preferably, the thickness of the end wall (54) is at least 20% greater than the thickness of the cylindrical body wall (48) as discussed at page 4 of the specification. One advantage of the dispensing device of the present invention is that the force needed to extrude dental material from the device is less than the force needed for conventional dispensing devices. The reduction in extrusion force is in the order of about 20 to 30%. It is believed that this improvement in extrusion force is partly owed to the structure of the cartridge.

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Turning back to Schulman, there is no hint or suggestion in the disclosure therein for a cartridge having a cylindrical body with an end wall portion that is substantially greater in thickness than the thickness of the side wall. As discussed above, Schulman is only interested in a discharge nozzle, not a cylindrical body, having a variation in wall thickness. "According to the invention, the discharge nozzle is designed as such to withstand the pressure exerted by the plunging piston . . ." (col. 3, lines 51-53). Thus, a person of ordinary skill in the art, looking at the disclosure in Schulman, would have absolutely no basis to modify its teachings to include a cylindrical body having walls of variable thickness.

Accordingly, it is respectfully requested that the rejection of claims 1-18 and 20-22 (as amended) under 35 U.S.C. § 103(a) in view of Evers et al., U.S. Patent 6,503,084 ("Evers"); Bender, U.S. Patent 5,707,234 ("Bender") and Schulman, U.S. Patent 5,460,523 ("Schulman") be withdrawn.

Allowable Subject Matter

Applicants acknowledge that the Office Action indicates that claim 19 contains allowable subject matter.

Conclusion

In summary, Applicants submit that claims 1-22 as amended are patentable and each of the Examiner's rejections and objections has been overcome. Accordingly, Applicants request favorable consideration and allowance of amended claims 1-22.

The Commissioner is hereby authorized to charge any additional fee required in connection with the filing of this paper or credit any overpayment to Deposit Account No. 04-0780. Should there be any outstanding matter that needs to be resolved in the present application; the Examiner is invited to contact the undersigned at the telephone number provided below.

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Respectfully submitted,

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Attachments: Request for Continued Examination Transmittal